Remarks

Entry of the amendments, reconsideration of the application, as amended, and allowance of all pending claims are respectfully requested. After entry of the amendments, claims 1-47 are pending. Support for the amendments can be found throughout the specification (see, e.g., FIGs. 12, 13a-13b and pages 48-59) of the specification.

In accordance with 37 C.F.R. 1.121, a marked-up version of the amended sections is provided on one or more pages separate from the amendment. These pages are appended at the end of the Response.

In the Office Action dated March 7, 2002, claims 1-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Maeurer et al. (U.S. Patent No. 5,301,323). Applicants respectfully, but most strenuously, traverse this rejection for the reasons below.

In one aspect of applicants' invention, the I/O configuration of a computing environment is dynamically changed in order to move available channel resources to where they are needed or to remove excess channel resources, without human intervention. To achieve this, as one example, a channel path to be used in the dynamic adjusting is selected. The selection can take into consideration various characteristics, such as I/O velocity and/or others.

In one example, applicants claim a method of managing input/output (I/O) configurations of a computing environment (e.g., claim 1). The method includes, for instance, selecting a channel path from a plurality of channel paths to be used in adjusting an I/O configuration of the computing environment, the selecting being based at least in part on an I/O velocity resulting from selecting the channel path; and dynamically adjusting the I/O configuration using the selected channel path. Thus, in applicants' claimed invention, the selecting of the channel path used to adjust the I/O configuration is based at least in part on I/O velocity. This is very different from the teachings of Maeurer.

Although Maeurer addresses dynamic channel path management, Maeurer does not take into consideration I/O velocity when making adjustments, but instead, makes adjustments based on channel path utilization. This is explicitly stated in Maeurer. For example, at Col. 8, lines 32-35, Maeurer recites locating the CHPID with minimum utilization. Further, in Col. 9, lines 33-35, it states "The CHPID with the most available utilization is always selected."

Channel utilization is distinct from I/O velocity. Channel utilization represents how much the channel is used, while I/O velocity represents a response time (see, e.g., page 48 of applicants' specification). That is, I/O velocity represents a ratio of wait time-to-usage, which indicates how long one waits for a channel versus how long

one uses it. Thus, with applicants' invention, if a channel
has high usage, but the wait time is low, then no action
needs to be taken. However, if the wait time is high, even
though usage is low, then more bandwidth is needed. This is
distinct from Maeurer in which a test based on channel
utilization would yield very different results. For
example, in Maeurer, if usage is high, a need for more
bandwidth is indicated, regardless of the fact that wait
time is low.

Since Maeurer teaches the use of channel path
utilization in selecting the channel path used to adjust an
I/O configuration, and does not teach or suggest the use of
I/O velocity, as claimed by applicants, applicants
respectfully submit that their invention, as claimed, is not
anticipated, taught nor suggested by Maeurer. Thus,
applicants respectfully submit that independent claim 1, as
well as independent claims 14, 27 and 28 are patentable over
Maeurer.

Additionally, the dependent claims are patentable for
the same reasons as the independent claims, as well as for
their own additional features. For example, dependent claim
41 indicates that the channel path used in the adjusting can
be selected from a plurality of channel paths that includes
both channel paths that can be added, as well as channel
paths that can be deleted, and that the selecting
concurrently takes into consideration the one or more paths
that can be added and the one or more paths that can be
deleted. This is not described, taught or suggested in

Maeurer. In Maeurer, the technique first tries to find a channel path to be added, and then only if no adds are possible, does it attempt to find a path to be deleted. It does not concurrently consider both the add and delete possibilities. Thus, Maeurer does not anticipate applicants' claimed invention.

In another example, applicants claim (e.g., claim 42) that the dynamically adjusting includes moving the selected channel path from one port to another port. Applicants respectfully submit that Maeurer does not describe, teach or suggest the possibility of moving a currently defined channel to a different port. Thus, Maeurer does not anticipate applicants' claimed invention.

In a further aspect of applicants' invention, applicants claim a method of managing input/output configurations of a computing environment (e.g., claim 43). The method includes, for instance, selecting a channel path from a plurality of channel paths to be used in adjusting an I/O configuration of the computing environment, the selecting being based on a plurality of characteristics; and dynamically adjusting the I/O configuration using the selected channel path. Thus, in this aspect of applicants' claimed invention, the channel path is selected based on a plurality of characteristics. In just one example, the plurality of characteristics may include I/O velocity and complexity of the resulting I/O configuration.

Again, this is very different from the teachings of Maeurer. In Maeurer, selection of the channel path is based solely on channel utilization. Thus, there is only one characteristic used in making the selection. This is in contrast to applicants' claimed invention, in which a plurality of characteristics are used in making the selection. Thus, Maeurer does not anticipate, teach or suggest applicants' claimed invention.

Based on the foregoing, applicants respectfully submit that all pending claims are patentable over Maeurer, and thus, applicants respectfully request an indication of allowance for all pending claims.

Should the Examiner wish to discuss this case with applicants' attorney, please contact applicants' attorney at the below listed number.

Respectfully submitted,

Blanche E. Schiller
Blanche E. Schiller
Attorney for Applicants
Registration No. 35,670

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HESLIN ROTHENBERG FARLEY & MESITI P.C.
5 Columbia Circle
Albany, New York 12203
Telephone: (518) 452-5600
Facsimile: (518) 452-5579

<u>**Version with markings to show changes made**</u>

<u>**In the Specification:**</u>

Paragraphs 2-5 in the Cross-Reference to Related Applications on page 1 (lines 11-29) and paragraphs 1-4 on page 2 (lines 1-15), have been amended as follows:

"Dynamically Redistributing Shareable Resources Of A Computing Environment To Manage The Workload Of That Environment," Kubala et al., (Docket No. PO9-99-159), Serial No. [_____] <u>09/408,470</u>, filed [herewith] <u>September 28, 1999</u>;

"Method, System And Program Products For Managing Groups Of Partitions Of A Computing Environment," Kubala et al., (Docket No. PO9-99-146), Serial No. [_____] <u>09/407,391</u>, filed [herewith] <u>September 28, 1999</u>;

"Method, System And Program Products For Managing Central Processing Unit Resources Of A Computing Environment," Eilert et al., (Docket No. PO9-99-148), Serial No. [_____] <u>09/407,212</u>, filed [herewith] <u>September 28, 1999</u>;

"Method, System And Program Products For Managing Logical Processors Of A Computing Environment," King et al., (Docket No. PO9-99-147), Serial No. [_____] <u>09/407,594</u>, filed [herewith] <u>September 28, 1999</u>;

"Processing Channel Subsystem Pending I/O Work Queues Based On Priorities," Maergner et al., (Docket No. PO9-99-145), Serial No. [_____] 09/407,459, filed [herewith] September 28, 1999;

"Method, System And Program Products For Determining I/O Configuration Entropy," William J. Rooney, (Docket No. PO9-99-157), Serial No. [_____] 09/407,453, filed [herewith] September 28, 1999;

"Method And Apparatus For Assigning Resources To Logical Partition Clusters," Rooney et al., (Docket No. PO9-99-063), Serial No. [_____] 09/407,810, filed [herewith] September 28, 1999; and

"Method And Apparatus For Creating And Identifying Logical Partition Clusters," Rooney et al., (Docket No. PO9-99-156), Serial No. [_____] 09/407,514, filed [herewith] September 28, 1999.

Paragraph 4 on page 55, lines 18-26 through page 56, lines 1-2, has been amended as follows:

Thereafter, a further determination is made as to whether there were any CHPIDs added to the list, INQUIRY 1412. If there were more CHPIDs added to the list, then processing continues with STEP 1406. However, if there are no SSCBs or CHPIDs added to the lists, INQUIRIES 1408, 1412, then for each SSCB in the list, a DSB array element is created, STEP 1414. That is, each of the SSCBs [are] is

added to the array of effected SSCBs. Additionally, each of the array elements is updated with actual and target I/O velocities, the current delta between the target and actual I/O velocities, and an SSCB pointer, STEP 1416.

In the Claims:

Claims 1, 6, 14, 19, 27, 28, and 33 have been amended, as follows:

1. (AMENDED) A method of managing input/output (I/O) configurations of a computing environment, said method comprising:

selecting a channel path from a plurality of channel paths to be used in adjusting an I/O configuration of said computing environment, said selecting being based [on one or more characteristics] associated with said channel path] <u>at least in part on an I/O velocity resulting from selecting the channel path</u>; and

dynamically adjusting said I/O configuration using the selected channel path.

6. (AMENDED) The method of claim 1, wherein said [one or more characteristics include at least one of an impact on response time,] <u>selecting is further based on at least one of</u> an impact on response time to achieve specific workload goals, contention on a subsystem of said I/O configuration,

availability characteristics of said channel path, and
complexity of the resulting I/O configuration.

14. (AMENDED) A system of managing input/output (I/O)
configurations of a computing environment, said system
comprising:

    means for selecting a channel path from a
    plurality of channel paths to be used in adjusting an
    I/O configuration of said computing environment, the
    selecting being based [on one or more characteristics
    associated with said channel path] <u>at least in part on
    an I/O velocity resulting from selecting the channel
    path</u>; and

    means for dynamically adjusting said I/O
    configuration using the selected channel path.

19. (AMENDED) The system of claim 14, wherein said
[one or more characteristics include at least one of an
impact on response time,] <u>selecting is further based on at
least one of</u> an impact on response time to achieve specific
workload goals, contention on a subsystem of said I/O
configuration, availability characteristics of said channel
path, and complexity of the resulting I/O configuration.

27. (AMENDED) A system of managing input/output (I/O)
configurations of a computing environment, said system
comprising:

a processor adapted to select a channel path from a plurality of channel paths to be used in adjusting an I/O configuration of said computing environment, the selecting being based [on one or more characteristics associated with said channel path] at least in part on an I/O velocity resulting from selecting the channel path; and

a processor adapted to dynamically adjust said I/O configuration using the selected channel path.

28. (AMENDED) At least one program storage device readable by a machine, tangibly embodying at least one program of instructions executable by the machine to perform a method of managing input/output (I/O) configurations of a computing environment, said method comprising:

selecting a channel path from a plurality of channel paths to be used in adjusting an I/O configuration of said computing environment, said selecting being based [on one or more characteristics associated with said channel path] at least in part on an I/O velocity resulting from selecting the channel path; and

dynamically adjusting said I/O configuration using the selected channel path.

33. (AMENDED) The at least one program storage device of claim 28, wherein said [one or more characteristics

include at least one of an impact on response time,]
<u>selecting is further based on at least one of</u> an impact on
response time to achieve specific workload goals, contention
on a subsystem of said I/O configuration, availability
characteristics of said channel path, and complexity of the
resulting I/O configuration.

New claims 41-47 have been added.